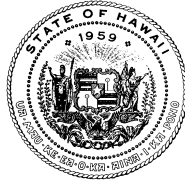


NEIL ABERCROMBIE
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In reply, please refer to:
EMD/CWB

12070PSS.13c
DATE: January 9, 2013
NPDES PERMIT NO.: HI 0021377
ZONE OF MIXING NO.: ZM-164

**FACT SHEET: REAPPLICATION FOR NATIONAL POLLUTANT DISCHARGE
ELIMINATION SYSTEM (NPDES) PERMIT AND ZONE OF MIXING
(ZOM) TO DISCHARGE TO THE PACIFIC OCEAN, WATERS OF
THE UNITED STATES**

**PERMITTEE: COUNTY OF HAWAII (COH)
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**

FACILITY: HILO WASTEWATER TREATMENT PLANT (WWTP)

FACILITY ADDRESS

Hilo Wastewater Treatment Plant
150 Kekuanaoa Place
Hilo, Hawaii 96720

PERMITTEE MAILING ADDRESS

County of Hawaii
Department of Environmental Management
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Hilo, Hawaii 96720
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FACT SHEET
PERMIT NO. HI 0021377
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This Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of the draft permit.

A. Permit Information

The following table summarizes administrative information related to the Hilo Wastewater Treatment Plant (hereinafter Facility).

Table F-1. Facility Information

Permittee	County of Hawaii, Department of Environmental Management
Name of Facility	Hilo Wastewater Treatment Plant
Facility Address	150 Kekuanaoa Place Hilo, Hawaii 96720
Facility Contact, Title, and Phone	Dora Beck, P.E., Acting Director, (808) 961-8083
Authorized Person to Sign and Submit Reports	Same as above
Mailing Address	Wastewater Division 108 Railroad Avenue Hilo, Hawaii 96720
Billing Address	Same as above
Type of Facility	Secondary Wastewater Treatment Plant
Pretreatment Program	NA
Reclamation Requirements	NA
Facility Design Flow	5.0 million gallons per day (MGD)
Receiving Waters	Pacific Ocean
Receiving Water Type	Marine
Receiving Water Classification	Class A Marine, Wet Open Coastal Waters HAR, Section 11-54-6(b)(2)(B)

1. NPDES Permit No. HI 0021377 and ZM-164 for the Hilo WWTP was issued on October 24, 2007, became effective on November 23, 2007, and expired at midnight, December 31, 2010. The Permittee reapplied for an NPDES permit and ZOM on July 19, 2010. The NPDES permit and ZOM were administratively extended on December 29, 2010, pending Department of Health (DOH) processing of the new application.
2. The Director of Health (hereinafter Director) proposes to issue a permit to discharge to the waters of the United States until midnight, five (5) years from the issuance date, and has included in the draft permit those terms and conditions which the Director has determined are necessary to carry out the applicable provisions of the Federal Water Pollution Control Act (P.L. 92-500), Federal Clean Water Act (P.L. 95-217) and Hawaii Revised Statutes, Chapter 342D.

B. Facility Setting

1. Facility Operation and Location

The Hilo WWTP is located at 150 Kekuanaoa Place, Hilo, Hawaii 96720 and serves the immediate Hilo area with a population of 31,000. The plant is an advanced secondary wastewater treatment facility designed to treat domestic wastewater from the Hilo area at an average flow of five (5) million gallons per day (MGD) and a peak wet weather flow of 13 MGD. The plant is designed to use a combination of physical, chemical and biological treatment processes to remove the inorganic materials and stabilize the organic particles in the domestic wastewater.

The preliminary treatment at Hilo WWTP consists of bar screening and grit removal. The primary treatment units follow the preliminary treatment process, and consists of preaeration tanks and settling clarifiers. Primary clarifier effluent is pumped to two attached growth biotowers for biological treatment. Here rotating distributors evenly apply wastewater to the media. Attached to the media are organisms making up the active zoogeal film which biologically breaks down the organic components contained in the wastewater. The wastewater then flows into the secondary clarifiers where quiescent hydraulic conditions allow the bacteria to floc together and settle out of the wastewater. The treated effluent leaving the plant is disinfected with chlorine solution. The secondary treated liquid effluent flows to the ocean via an outfall discharge pipe. The organic solids removed from the wastewater are subjected to further treatment to reduce, concentrate, and stabilize the sludge. After additional dewatering, the stabilized, treated sludge is disposed of at an approved landfill.

Secondary treated domestic wastewater is discharged into the waters of the Pacific Ocean east of the Hilo Bay breakwater, a Class A designated water, through an outfall and diffuser system which runs approximately 4500 feet offshore. Discharge is through a 210 feet long diffuser section at an average depth of approximately 52 feet, at coordinates: Latitude 19°44'38"N and Longitude 155°02'58"W (NAD 83).

Item K.1. of the proposed permit provides a map showing the location of the facility. Item K.2. of the proposed permit provides a map of the Zone of Mixing (ZOM) and receiving water monitoring station locations.

2. Receiving Water Classification

The receiving water, the Pacific Ocean, is classified by the DOH as Class A Wet Open Coastal Waters under Hawaii Administrative Rules (HAR), Section 11-54-6(b)(2)(B). It is the objective of Class A waters that their use for recreational purposes and aesthetic enjoyment be protected. Any other use shall be permitted as long as it is compatible with the protection and

propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. These waters shall not act as receiving waters for any discharges which have not received the best degree of treatment or control compatible with the criteria established for this class.

3. Ocean Discharge Criteria

The Director has considered the Ocean Discharge Criteria, established pursuant to Section 403(c) of the Clean Water Act for the discharge of pollutants into the territorial sea, the waters of the contiguous zone, or the oceans. The United States Environmental Protection Agency (EPA) has promulgated regulations for Ocean Discharge Criteria in 40 Code of Federal Regulations (CFR) Part 125, Subpart M. Therefore, the Director has determined that the discharge will not cause unreasonable degradation to the marine environment. Based on current information, the Director proposes to issue a permit.

4. Impaired Water Bodies on CWA 303(d) List

CWA Section 303(d) requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources.

On September 20, 2013, the EPA approved the 2012 State of Hawaii Water Quality Monitoring and Assessment Report, which includes the 2012 303(d) List of Impaired Water Bodies in the State of Hawaii.

The Pacific Ocean east of the Hilo Bay breakwater is not identified in the Clean Water Act, Section 303(d) list of impaired water bodies in the 2012 303(d) list. There is no assessment in that area. At present, no TMDLs have been established for this waterbody.

5. Zone of Mixing Designation

The Zone of Mixing (ZOM) shall be granted solely for the assimilation of secondary treated wastewater at a design flow of 5.0 mgd. The ZOM is a circular area with a radius of 1,000 feet and centered at Latitude 19°44'39"N, Longitude 155°02'58"W .

The continuation of the function or operation involved in the discharge by granting of the ZOM is in the public interest. The WWTP provides secondary treatment to the wastewater prior to discharge from the city of Hilo, Hawaii. Continued operation of the WWTP is in the public interest since it is the end result of the wastewater treatment process that serves the public by minimizing the impact to groundwater as well as shoreline waters. The treated discharge

is currently monitored under regulatory requirements intended to protect the environment as well as human health.

The discharge occurring does not substantially endanger human health or safety. For the period of December 2007 to December 2012, there were no exceedances of either the single sample or geometric mean for enterococci at the ZOM. For the same time period, there were 11 exceedances of the single sample permit limit (100 cfu/100 mL) and 15 exceedances of the geometric mean limit (7 cfu/100mL) at the nearshore location. If the proposed enterococci limits were in effect at that time, the exceedances of the single sample permit limit would remain at 11 and the exceedances of the geometric mean permit limit would have been reduced to just once. For the same time period, there were 117 exceedances of the single sample permit limit (100 cfu/100 mL) and 229 exceedances of the geometric mean limit (7 cfu/100mL) at the shoreline. If the proposed enterococci limits were in effect at that time, the exceedances would have been reduced to 115 exceedances of the single sample permit limit and 67 exceedances of the geometric mean limit. Based on the comparison of the results at the ZOM, the nearshore stations, and the shoreline, the County of Hawaii concludes that the exceedances are related to other sources. However, the DOH became aware of potentially unauthorized discharges in the vicinity of where the exceedances were found. See paragraph 7.b.

Compliance with water quality standards without a ZOM would require major upgrades to the WWTP in order to provide advanced wastewater treatment for a number of parameters without significant benefit due to the predominant influence to water quality from sources other than discharges from the WWTP. As such, the Hilo community would incur significant capital and operation and maintenance costs with little or no identifiable benefit to the public.

6. Summary of Existing Effluent Requirements and Monitoring Data

Effluent limitations contained in the existing permit for discharges from Outfall Serial No. 001 and representative monitoring data from January 2008 through December 2012 is presented in the following table.

Table F-2. Existing Effluent Requirements and Monitoring Data

Parameter	Units	Effluent Limitation			Reported Data ¹		
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily
Flow	MGD	²	²	--	4.1	6.3	--
Biochemical Oxygen Demand (5-Day)	mg/L	30	45	--	13	16	--
	kg/day	568	852	--	152	227	--
	% Removal	As a monthly average, not less than 85 percent removal efficiency from influent stream.			82 ³		
Total Suspended Solids	mg/L	30	45	--	13	16	--
	kg/day	568	852	--	142	208	--
	% Removal	As a monthly average, not less than 85 percent removal efficiency from influent stream.			92 ³		
pH	standard units	Not less than 6.0 nor greater than 9.0			6.7 – 7.4		
Enterococci	CFU/100 mL	^{2,4}	--	--	41,000	--	--
Total Residual Chlorine	µg/L	--	--	471	--	--	400
Total Nitrogen	mg/L	--	--	²	--	--	16
Ammonia Nitrogen	mg/L	--	--	²	--	--	12
Nitrate + Nitrite Nitrogen	mg/L	--	--	²	--	--	7.8
Total Phosphorus	mg/L	--	--	²	--	--	3
Turbidity	NTU	--	--	²	--	--	6
Chronic Toxicity – <i>Ceriodaphnia Dubia</i>	TUc	--	--	62.8	--	--	31.5
Chronic Toxicity – <i>Tripneustes Gratilla</i>	TUc	--	--	⁵	--	--	>253

¹ Maximums of data reported in monthly DMRs submitted by the Permittee from December 2007 through December 2012.

² No effluent limitations for this pollutant in the previous permit, only monitoring required.

³ Represents the minimum reported percent removal.

⁴ Enterococci reported as monthly geometric mean.

⁵ The chronic toxicity discharge limitation of 62.8 TUc listed in Part A.1 of the previous permit does not apply to monitoring results for toxicity tests using *Tripneustes gratilla*.

7. Compliance Summary

- a. **Effluent Limitation Violations.** The following table lists effluent limitation violations as identified in DMRs submitted by the Permittee from December 2007 to December 2012.

Table F-3. Summary of Effluent Limitation Exceedances

Parameter (units)	Discharge Limitation	Number of Exceedances	Range of Exceedance Values
Biochemical Oxygen Demand, 30-day Average, % removal	>85%	1	82
Nitrate + Nitrite Nitrogen (mg/l)	7.5 ¹	1	7.8

¹ Threshold Value - not permit violation.

The effluent had been meeting the whole effluent toxicity (WET) requirement until September 28, 2010. WET had not passed six (6) consecutive accelerated tests until December 2012.

- b. **Unauthorized Discharges.** The Department has become aware that currently, there may be unauthorized discharges of treated effluent from leaks in the Hilo WWTP outfall pipe and requested information from the Permittee regarding this issue. The County's response identified the following joint leaks:

- Sta. 5+95.00 – A joint leak first detected in May 2005 with no leak observed during the November 2010 and April 2012 inspections. However, a leak was observed approximately 20 feet away from the joint during the March 2013 inspection.
- Sta. 8+55 – A joint leak first detected in October 2001 and present during subsequent inspections conducted in May 2005, November 2010, and March 2013.

Also, in the April 20, 2012 inspection, STA 41+54 to STA 41+92 were identified as sections of the Hilo outfall to be repaired. The 2010 outfall inspection results from the Hilo Outfall Repair and Maintenance Conservation District Use Application showed the following observed leaks which have occurred (2010, 2005, and 2001 at 8+55; 2005 at 5+95; 2005 at 40+51) and undercut segment 41+68 to 41+92.

c. Inspections Conducted

**(1) August 10, 2009 – Compliance Evaluation Inspection (CEI)
conducted by PG Environmental, LLC**

Major Findings included:

- (a)** Receiving water exceedances for Enterococci and Nitrate + Nitrite Nitrogen
- (b)** Facility could not provide documentation that an “initial investigation TRE Workplan” had been developed and submitted
- (c)** Equipment maintenance records were incomplete
- (d)** Facility was unable to provide a full inventory of critical parts kept on-site
- (e)** Facility did not appear to provide proper maintenance of systems for treatment and control as required under standard provisions
- (f)** Effluent monitoring wasn’t conducted as required
- (g)** Analytical equipment calibration was incomplete

(2) September 21, 2011 – CEI conducted by PG Environmental, LLC

Major Findings included:

- (a)** No initial investigation TRE workplan maintained at the facility nor was documentation that the workplan had been submitted to the DOH
- (b)** No TRE workplan maintained at the facility nor was documentation that the workplan had been submitted to the DOH
- (c)** No documentation that the required annual sludge report was submitted as required
- (d)** No documentation that the required Wastewater Pollution Prevention Program had been developed or submitted to the DOH
- (e)** Certified DMRs were not available for review
- (f)** Receiving water exceedances for Enterococci and nutrients (All controls stations also exceeded)
- (g)** Laboratory thermometer was out of calibration

(3) January 14, 2013 – CEI conducted by PG Environmental, LLC

The inspection report is not yet available.

d. Actions Taken

- (1) A Notice of Apparent Violation (NAV), dated April 21, 2010, was issued to the Permittee for findings during the CEI conducted on August 10, 2009. The Permittee responded to the NAV in a document dated May 18, 2010. Responses and corrective actions made by the Permittee included:
 - (a) Improvements to analytical record keeping
 - (b) Attribution of receiving water exceedances to non-discharge (no fault) related causes
 - (c) Submission of an initial investigation TRE workplan
 - (d) Preventative Maintenance tracking system would be implemented by September 2010
 - (e) Critical inventory listing would be completed by June 1, 2010
 - (f) Facility did not concur that proper maintenance of systems was not conducted
 - (g) Effluent monitoring practices were revised
 - (h) Equipment calibration was improved
- (2) A Request for Information, dated April 12, 2013, was sent to the Permittee regarding the potential unauthorized discharges of treated effluent from leaks in the Hilo WWTP outfall pipe. The County of Hawaii responded on May 15, 2013. In their response, the County identified several joint leaks on the outfall piping, but did not consider small discharges from joint locations as not normal or as unauthorized discharges.

8. Planned Changes

There are no planned changes expected during the term of the draft permit. However, as stated above, a potential leak has been detected in the discharge outfall that the Hilo WWTP is proposing to repair.

C. Applicable Plans, Policies, and Regulations

1. Hawaii Administrative Rules, Chapter 11-54

On November 12, 1982, the Hawaii Administrative Rules, Title 11, Department of Health, Chapter 54 became effective (hereinafter HAR, Chapter 11-54). HAR, Chapter 11-54 was amended and compiled on October 6, 1984; April 14, 1988; January 18, 1990; October 29, 1992; April 17, 2000; October 2, 2004; June 15, 2009; and the most recent amendment was on October 21, 2012. HAR, Chapter 11-54 establishes beneficial uses and classifications of state waters, the state antidegradation policy, zones of mixing standards, and water quality criteria that are applicable to the Pacific Ocean.

Requirements of the proposed permit implement HAR, Chapter 11-54.

2. Hawaii Administrative Rules, Chapter 11-55

On November 27, 1981, HAR, Title 11, Department of Health, Chapter 55 became effective (hereinafter HAR, Chapter 11-55). HAR, Chapter 11-55 was amended and compiled on October 29, 1992; September 22, 1997; January 6, 2001; November 7, 2002; August 1, 2005; October 22, 2007; June 15, 2009; and the most recent amendment was on October 21, 2012. HAR, Chapter 11-55 establishes standard permit conditions and requirements for NPDES permits issued in Hawaii.

Requirements of the proposed permit implement HAR, Chapter 11-55.

3. State Toxics Control Program

NPDES Regulations at 40 CFR 122.44(d) require permits to include water quality-based effluent limitations (WQBELs) for pollutants, including toxicity, that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an exceedance of a water quality standard. The *State Toxics Control Program: Derivation of Water Quality-Based Discharge Toxicity Limits for Biomonitoring and Specific Pollutants* (hereinafter, STCP) was finalized in April, 1989, and provides guidance for the development of water quality-based toxicity control in NPDES permits by developing the procedures for translating water quality standards (WQS) in HAR, Chapter 11-54 into enforceable NPDES permit limits. The STCP identifies procedures for calculating permit limits for specific toxic pollutants for the protection of aquatic life and human health.

Guidance contained in the STCP was used to determine effluent limitations in the proposed permit.

D. Rationale for Effluent Limitations and Discharge Specifications

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. NPDES regulations establish two principal bases for effluent limitations. At 40 CFR 122.44(a), permits are required to include applicable technology-based limitations and standards; and at 40 CFR 122.44(d), permits are required to include WQBELs to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. When numeric water quality objectives have not been established, but a discharge has the reasonable potential to cause or contribute to an excursion above a narrative criterion, WQBELs may be established using one or

more of three methods described at 40 CFR 122.44(d): 1) WQBELs may be established using a calculated water quality criterion derived from a proposed state criterion or an explicit state policy or regulation interpreting its narrative criterion; 2) WQBELs may be established on a case-by-case basis using EPA criteria guidance published under CWA Section 304(a); or 3) WQBELs may be established using an indicator parameter for the pollutant of concern.

1. Technology-Based Effluent Limitations

a. Scope and Authority

Section 301(b) of the CWA and implementing EPA permit regulations at 40 CFR 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this permit must meet minimum federal technology-based requirements based on Secondary Treatment Standards at 40 CFR 133.

Regulations promulgated in 40 CFR 125.3(a)(1) require technology-based effluent limitations for municipal dischargers to be placed in NPDES permits based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for publically owned treatment works (POTWs) [defined in section 304(d)(1)]. CWA Section 301(b)(1)(B) requires that such treatment works must, as a minimum, meet effluent limitations based on secondary treatment as defined by the EPA Administrator.

40 CFR 133.102 established the minimum level of effluent quality attainable by secondary treatment in terms of the parameters Biochemical Oxygen Demand (5-day), Total Suspended Solids, and pH.

b. Applicable Technology-Based Effluent Limitations

At 40 CFR 133 in the Secondary Treatment Regulations, EPA has established the minimum required level of effluent quality attainable by secondary treatment shown in Table F-4 below. The standards in Table F-4 are applicable to the facility and therefore established in the draft permit as technology-based effluent limitations.

Table F-4. Applicable Technology-Based Effluent Limitations

Parameter	Units	30-Day Average	7-Day Average
BOD ₅ ¹	mg/L	30	45
TSS ¹	mg/L	30	45
pH	standard units	6.0 – 9.0	

¹ The 30-day average percent removal shall not be less than 85 percent.

2. Water Quality-Based Effluent Limitations (WQBELs)

a. Scope and Authority

NPDES Regulations at 40 CFR 122.44(d) require permits to include WQBELs for pollutants, including toxicity, that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard (reasonable potential). As specified in 40 CFR 122.44(d)(1)(i), permits are required to include WQBELs for all pollutants “which the Director determines are or may be discharged at a level that will cause, have reasonable potential to cause, or contribute to an excursion above any state water quality standard.”

The process for determining reasonable potential and calculating WQBELs, when necessary, is intended to protect the receiving waters as specified in HAR, Chapter 11-54. When WQBELs are necessary to protect the receiving waters, the DOH has followed the requirements of HAR, Chapter 11-54, the STCP, and other applicable state and federal guidance policies to determine WQBELs in the draft permit.

Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established in accordance with the requirements of 40 CFR 122.44(d)(1)(vi), using (1) EPA criteria guidance under CWA Section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state’s narrative criterion, supplemented with other relevant information.

b. Applicable Water Quality Standards

The beneficial uses and WQS that apply to the receiving waters for this discharge are from HAR, Chapter 11-54.

(1) **HAR, Chapter 11-54.** HAR, Chapter 11-54 specifies numeric aquatic life standards for 72 toxic pollutants and fish consumption standards for 60 toxic pollutants, as well as narrative standards for toxicity. Effluent limitations and provisions in the proposed permit are based on available information to implement these standards.

(2) **Water Quality Standards.** The facility discharges to the Pacific Ocean, which has a dissolved inorganic ion concentration well above 0.5 parts per thousand (ppt). As specified in HAR, Chapter 11-54, saltwater standards apply when the dissolved inorganic ion concentration is above 0.5 ppt. As such, a reasonable potential analysis was conducted using saltwater standards. Additionally, fish consumption WQS were also used in the RPA to protect human health. Where both saltwater standards and fish consumption standards are available for a particular pollutant, the more stringent of the two (2) will be used in the RPA.

40 CFR 122.45(c) requires effluent limitations for metals to be expressed as total recoverable metal. Since water quality standards for metals are expressed in the dissolved form in HAR, Chapter 11-54, factors or translators must be used to convert metal concentrations from dissolved to total recoverable. Default EPA conversion factors were used to convert the applicable dissolved criteria to total recoverable.

(3) **Receiving Water Hardness.** HAR, Chapter 11-54 contains water quality criteria for six metals that vary as a function of hardness in freshwater. A lower hardness results in a lower freshwater water quality standard. The metals with hardness dependent standards include cadmium, copper, lead, nickel, silver, and zinc. Ambient hardness values are used to calculate freshwater water quality standards that are hardness dependent. Since saltwater standards are used for the RPA, the receiving water hardness was not taken into consideration when determining reasonable potential.

c. Determining the Need for WQBELs

NPDES regulations at 40 CFR 122.44(d) require effluent limitations to control all pollutants which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State WQS. Assessing whether a pollutant has reasonable potential is the fundamental step in determining whether or not a WQBEL is required. Using the methods prescribed in EPA's *Technical Support Document for Water Quality-Based Toxics Control* (the TSD, EPA/505/2-90-001, 1991), effluent data were analyzed to determine if the discharge demonstrates reasonable potential. The Reasonable Potential

Analysis (RPA) compared the effluent data with numeric and narrative WQS in HAR, Chapter 11-54. To determine reasonable potential for parameters contained in HAR, Chapter 11-54-6, a direct comparison of the effluent's maximum effluent concentration was compared to the most stringent WQS.

- (1) Reasonable Potential Analysis (RPA).** The RPA for pollutants with WQS specified in HAR, Chapter 11-54-4, based on the TSD, combines knowledge of effluent variability as estimated by a coefficient of variation with the uncertainty due to a limited number of data to project an estimated maximum receiving water concentration as a result of the effluent. The estimated receiving water concentration is calculated as the upper bound of the expected lognormal distribution of effluent concentrations at a high confidence level. The projected maximum receiving water concentration, after consideration of dilution, is then compared to the WQS in HAR, Chapter 11-54 to determine if the pollutant has reasonable potential. The projected maximum receiving water concentration has reasonable potential if it cannot be demonstrated with a high confidence level that the upper bound of the lognormal distribution of effluent concentrations is below the receiving water standards.

Because the most stringent WQS for pollutants specified in HAR, Paragraph 11-54-6(b)(3) are provided as geometric means and exceedances of these WQS are less sensitive to effluent variability, the RPA was conducted by doing a comparison of the maximum effluent concentration multiplied by the far-field dilution factor to the most stringent applicable WQS.

- (2) Effluent Data.** The RPA was based on effluent monitoring data submitted to the DOH in the monthly and quarterly DMRs submitted by the Permittee from December 2008 through December 2012 and additional sampling for cyanide performed in 2012.
- (3) Dilution.** The STCP discusses dilution, defined as the reduction in the concentration of a pollutant or discharge which results from mixing with the receiving waters, for submerged and high-rate outfalls. The STCP states that minimum dilution is used for establishing effluent limitations based on chronic criteria and human health standards for non-carcinogens, and average conditions is used for establishing effluent limitations based on human health standards for carcinogens. The previous permit included a dilution of 62.8:1 (seawater:effluent) for effluent limitations. The dilution used was based on the results of a 2005 Dilution Study (hereinafter Study) conducted by a contractor (Brown and Caldwell) using EPA's mathematical model, PLUMES. In the Study, the critical minimum initial dilution was determined to be

62.8:1. EPA's *Initial Mixing Characteristic of Municipal Ocean Discharges* indicates that "worst-case" conditions be evaluated using a combination of conservative values for conditions affecting initial dilution. Although no average dilution was provided, using a minimum critical initial dilution of 62.8:1 for calculating effluent limitations for human health standard for carcinogens is more conservative than an average dilution and will still be protective of water quality. Therefore, because only a critical minimum initial dilution was used in the previous permit and a new dilution study has not been conducted, the DOH has determined the critical short-term initial dilution of 62.8:1 is still protective of water quality for chronic and fish consumption criteria for non-carcinogens, and fish consumption criteria for carcinogens.

HAR, Section 11-54-9 allows the use of a ZOM to demonstrate compliance with WQS. ZOMs consider initial dilution, dispersion, and reactions from substances which may be considered to be pollutants. However, due to other potential sources of pollutants into the receiving water, such as storm water runoff or unidentified discharges, it is often problematic to determine the cause of WQS exceedances in the receiving water at the edge of a ZOM. It is more practical to determine the available dilution provided in the ZOM and apply that dilution to the WQS to calculate an effluent limitation that can be applied end-of-pipe. However, an available dilution at the edge of the ZOM is not currently known for this discharge. Thus, for HAR, Paragraph 11-54-6(b)(3) parameters, reasonable potential to contribute to an exceedance of WQS is most reasonably assessed by comparing monitoring data at the edge of the ZOM to the applicable WQS. If an annual geometric mean at the edge of a ZOM exceeds the applicable WQS, the Permittee is determined to have reasonable potential for the pollutant. If an exceedance of WQS is not observed at the edge of the ZOM, it is assumed that sufficient dilution and assimilative capacity exists to meet WQS at the edge of the ZOM.

Where reasonable potential has been determined for HAR, Paragraph 11-54-6(b)(3) pollutants, limitations must be established that are protective of water quality. Because the dilution at the edge of the ZOM is not known, where assimilative capacity exists this permit establishes limitations for HAR, Paragraph 11-54-6(b)(3) pollutants as performance-based effluent limitations and receiving water limitations and requires the Permittee to conduct a dilution analysis at the edge of the ZOM so that end-of-pipe effluent limitations may be established during future permitting efforts. Where assimilative capacity does not exist, it is not appropriate to grant a ZOM and/or dilution, and an end-of-pipe criteria-based effluent limitation must be established that is protective of WQS.

Assimilative capacity for pollutants with reasonable potential is evaluated for HAR, Paragraph 11-54-6(b)(3) pollutants by aggregating all ZOM control station data annually and comparing the annual geometric means to the applicable WQS. If an annual geometric mean exceeds 90 percent of the WQS, assimilative capacity is determined to be insufficient and dilution may not be granted.

The STCP defines dilution as the reduction in the concentration of a pollutant or discharge which results from mixing with the receiving waters, and discusses dilution for the two main categories of direct dischargers in Hawaii, marine discharges with submerged outfalls and marine dischargers without submerged outfalls. It states a submerged outfall provides discharge induced dilution while most surface discharges do not. The facility discharges through an outfall and diffuser system which runs approximately 4500 feet offshore. Discharge is through a 210 feet long diffuser section at an average depth of approximately 52 feet. The Permittee conducted a dilution study resulting in a dilution factor of 62.8 and far-field dilution of 835.

- (4) Summary of RPA Results.** The maximum effluent concentrations from the DMRs, maximum projected receiving water concentration calculated using methods from the TSD, the applicable HAR, Paragraph 11-54-4(b)(3) or 11-54-5.2 WQS, and result of the RPA for pollutants discharged from the facility are presented in Table F-10, below. Only pollutants detected in the discharge, and toxics that had effluent limitations in the previous permit, are presented in Table F-10. All other pollutants were not detected and therefore, no reasonable potential exists.

Table F-5. Summary of RPA Results

Parameter	Units	Number of Samples	Dilution	Maximum Effluent Concentration	Maximum Projected Concentration	Applicable Water Quality Standard	RPA Results
Antimony, Total Recoverable	µg/L	3	62.8:1	0.238	0.021	15,000	No
Arsenic, Total Recoverable	µg/L	3	62.8:1	18	1.605	36	No
Chromium, Total Recoverable	µg/L	3	62.8:1	1.28	0.114	50 ¹	No
Copper, Total Recoverable	µg/L	3	62.8:1	4.53	0.40	3.5	No
Lead, Total Recoverable	µg/L	3	62.8:1	0.291	0.026	5.9	No
Nickel, Total Recoverable	µg/L	3	62.8:1	2.72	0.243	8.4	No
Selenium, Total Recoverable	µg/L	3	62.8:1	0.447	0.040	71	No

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Parameter	Units	Number of Samples	Dilution	Maximum Effluent Concentration	Maximum Projected Concentration	Applicable Water Quality Standard	RPA Results
Silver, Total Recoverable	µg/L	3	62.8:1	0.318	0.028	2.7	No
Zinc, Total Recoverable	µg/L	3	62.8:1	25	2.23	91	No
Cyanide	µg/L	3	62.8:1	30	1.18	1	Yes
Chloroform	µg/L	3	62.8:1	0.38	0.03	5	No
Bis(2-Ethylhexyl)Phthalate	µg/L	3	62.8:1	27	2.41	16,000	No
1,4-Dichlorobenzene	µg/L	3	62.8:1	0.12	0.011	660	No
Total Residual Chlorine	µg/L	61	62.8:1	400	6.33	7.5	No
Total Nitrogen	µg/L	61	---	119.5 ²	NA	150	No
Ammonia Nitrogen	µg/L	61	---	1.7 ²	NA	3.5	No
Nitrate + Nitrite Nitrogen	µg/L	61	---	9.3 ²	NA	5.0 ³	Yes
Total Phosphorus	µg/L	61	---	15.5 ²	NA	20	No
Enterococci	CFU/100 mL	61	62.8:1	41,000	644.56	35	Yes

NA - Not Applicable

¹ Water quality standard is expressed as Chromium VI.

² Maximum annual geometric mean at the edge of the ZOM.

³ ZOM data for control stations O/S and N/S indicates that assimilative capacity does not exist.

(5) Reasonable Potential Determination.

(a) Constituents with limited data. In some cases, reasonable potential cannot be determined because effluent data are limited. The draft permit requires the Permittee to continue to monitor for these constituents in the effluent using analytical methods that provide the lowest available detection limitations. When additional data become available, further RPAs will be conducted to determine whether to add numeric effluent limitations to this draft permit or to continue monitoring.
Data for the following parameters was not available:

- Dioxin TEQ
- 1,2,4,5-Trichlorobenzene
- 2,3,4,6-Tetrachlorophenol
- Aluminum
- Chlorpyrifos
- Cyclohexane-technical
- Dichlorophenol (2,4)
- Isopropylchloroether
- Methyl(bis)chloroether
- Nitrosamines

- Nitroso-dibutylamine-N
- Nitroso-diethylamine-N
- Pentachloroethanes
- Pyrrolidine-N
- Tetrachloroethanes
- Tributyltin

(b) Pollutants with No Reasonable Potential. WQBELs are not included in this proposed permit for constituents listed in HAR, Subsection 11-54-4(b)(3) that do not demonstrate reasonable potential; however, monitoring for such pollutants is still required in order to collect data for future RPAs. Pollutants with no reasonable potential consist of those identified as such in Table F-5 or any pollutant not discussed in Parts D.2.c.(5)(a) or D.2.c.(5)(c) of this Fact Sheet.

(c) Pollutants with Reasonable Potential. The RPA indicated that cyanide, nitrate + nitrite nitrogen, and enterococci have reasonable potential to cause, or contribute to an excursion above State WQS. Thus, WQBELs have been established in this proposed permit for cyanide, nitrate + nitrite nitrogen, and enterococci. The WQBEL for enterococci is based upon 40 CFR 131.41 for recreational waters in Hawaii over 300 meters from the shoreline. The WQBEL for cyanide was calculated based on WQS contained in HAR, Chapter 11-54 and procedures contained in both STCP and HAR, Chapter 11-54, as discussed in Part D.2.d, below. Nitrate + nitrite nitrogen is limited at the end of the pipe as a geometric mean based on WQS contained in HAR, Chapter 11-54.

d. WQBEL Calculations

Specific pollutant limits may be calculated for both the protection of aquatic life and human health.

(1) WQBELs based on Aquatic Life Standards. The STCP categorizes a discharge from a facility into one of four categories: (1) marine discharges through submerged outfalls; (2) discharges without submerged outfalls; (3) discharges to streams; or (4) high-rate discharges. Once a discharge has been categorized, effluent limitations for pollutants with reasonable potential can be calculated, as described below.

- (a) For marine discharges through submerged outfalls, the daily maximum effluent limitation shall be the product of the chronic water quality standard and the minimum dilution factor;
 - (b) For discharges without submerged outfalls, the daily maximum effluent limitation shall be the acute toxicity standard. More stringent limits based on the chronic standards may be developed using Best Professional Judgment (BPJ);
 - (c) For discharges to streams, the effluent limitation shall be the most stringent of the acute standard and the product of the chronic standard and dilution; and
 - (d) For high rate outfalls, the maximum limit for a particular pollutant is equal to the product of the acute standard and the acute dilution factor determined according to Section II.B.4 of the STCP. More stringent limits based on chronic standards may be developed using BPJ.
- (2) **WQBELs based on Human Health Standards.** The STCP specifies that the fish consumption standards are based upon the bioaccumulation of toxics in aquatic organisms followed by consumption by humans. Limits based on the fish consumption standards should be applied as 30-day averages for non-carcinogens and annual averages for carcinogens.

The discharge from this facility is considered a marine discharge through a submerged outfall. Therefore, for pollutants with reasonable potential, the draft permit establishes, on a pollutant by pollutant basis, daily maximum effluent limitations based on saltwater chronic aquatic life standard after considering dilution and average monthly effluent limitations for non-carcinogens or annual average effluent limitations for carcinogens based on the human health standard after considering dilution. WQBELs established in the draft permit are discussed in detail below.

(3) Calculation of Pollutant-Specific WQBELs.

As discussed in Part D.2.c.(3) of this Fact Sheet, a dilution of 62.8:1 has been granted.

The following equations were used to calculate reasonable potential for the pollutants below.

$$\text{Projected Maximum RWC} = \text{MEC} \times 95\%_{\text{ratio}} \times \text{Dm}$$

Where: RWC = Receiving water concentration
MEC = Maximum effluent concentration reported
95%_{ratio} = The 95% ratio from Table 3-2 in the TSD
or calculated using methods in
Section 3.3.2 of the TSD.
Dm = Percent Dilution (i.e., 1/62.8)

If the projected maximum receiving water concentration is greater than the applicable water quality standard from HAR, Chapter 11-54, the reasonable potential exists for the pollutant and effluent limitations are established. Pollutants with reasonable potential are discussed below in detail.

(a) Cyanide

- (i) **Cyanide Water Quality Standards.** The most stringent applicable water quality standard for cyanide is the chronic saltwater WQS of 1 µg/L, as specified in HAR, Chapter 11-54. There are no fish consumption standards for cyanide in HAR, Chapter 11-54.
- (ii) **RPA Results.** The Permittee reported thirteen data points for cyanide (n = 13), resulting in a CV = 1.534. Based on a CV of 1.534 and 13 samples, the 95% multiplier calculated using methods described in section 3.3.2 of the TSD was 2.475. As discussed in Part D.2.c.(3), the facility is granted a dilution of 62.8:1. Therefore, Dm = 1.59%.

The maximum effluent concentration for cyanide was 30 µg/L.

$$\begin{aligned}\text{Projected Maximum RWC} &= \text{MEC} \times 95\%_{\text{ratio}} \times \text{Dm} \\ &= 30 \mu\text{g/L} \times 2.475 \times 1/62.8 \\ &= 1.18 \mu\text{g/L}\end{aligned}$$

$$\text{HAR, Chapter 11-54 WQS} = 1 \mu\text{g/L}$$

The projected maximum receiving water concentration (1.18 µg/L) exceeds the most stringent applicable water quality standard for this pollutant (1 µg/L), demonstrating reasonable potential. Therefore, the draft permit establishes effluent limitations for cyanide.

- (iii) **Cyanide WQBELs.** WQBELs for cyanide are calculated using STCP procedures and are based on the chronic aquatic life water quality standard. The draft permit establishes a daily maximum effluent limitation for cyanide of 62.8 µg/L based on

the chronic aquatic life water quality standard and a dilution of 62.8:1.

- (iv) **Feasibility.** The maximum effluent concentration reported for cyanide during the term of the previous permit was 30 µg/L. Since the maximum effluent concentration is less than the proposed maximum daily effluent limitation of 62.8 µg/L, the DOH has determined that the facility will be able to immediately comply with proposed maximum daily cyanide effluent limitations.
- (v) **Anti-backsliding.** Anti-backsliding regulations are satisfied because the previous permit did not establish effluent limitations for cyanide, thus these limitations are at least as stringent as the previous permit.

(b) Chlorine

- (i) **Chlorine WQS.** The most stringent applicable WQS for chlorine, is the chronic saltwater WQS of 7.5 µg/L as specified in HAR, Paragraph 11-54-4(b)(3). There are no fish consumption standards for chlorine in HAR, Chapter 11-54.
- (ii) **RPA Results.** The Permittee reported 61 data points for chlorine ($n = 61$), resulting in a CV of 0.318. Based on a CV of 0.318 and 61 samples, the 95% multiplier calculated using methods described in section 3.3.2 of the TSD was 0.99. As discussed in Part D.2.c.(3), the facility is granted a dilution of 62.8:1. Therefore, $D_m = 1.59\%$.

The maximum effluent concentration for chlorine was 400 µg/L.

$$\begin{aligned}\text{Projected Maximum RWC} &= \text{MEC} \times 95\% \text{ratio} \times D_m \\ &= 400 \times 0.99 \times 1/62.8 \\ &= 6.306 \text{ µg/L}\end{aligned}$$

$$\text{HAR, Chapter 11-54 WQS} = 7.5 \text{ µg/L}$$

The projected maximum receiving water concentration does not exceed the WQS for this pollutant, and thus does not demonstrate reasonable potential.

- (iii) **Chlorine WQBELs.** Although there is no reasonable potential for the discharge to exceed the applicable chlorine WQS, the proposed permit includes effluent limitations for total residual chlorine. The Permittee has expressed an interest in

relocating their sampling point and increasing their chlorine dosage, so effluent limitations for total residual chlorine would ensure continued compliance with the applicable WQS.

(iv) **Feasibility.** Not applicable.

(v) **Anti-backsliding.** Anti-backsliding requirements are satisfied because the effluent limitation is the same as in the previous permit.

e. Nitrate + Nitrite Nitrogen

HAR, Chapter 11-54-6(b)(3) establishes the following WQS for nitrate plus nitrite nitrogen:

Parameter	Geometric Mean	Value not to exceed more than 10% of the time	Value not to exceed more than 2% of the time
Nitrate + Nitrite Nitrogen (µg/L)	5.00	14.00	25.00

As demonstrated in Table F-5 of this Fact Sheet, reasonable potential to exceed applicable WQS for nitrate + nitrite nitrogen has been determined.

Zone of mixing data from January 2008 through December 2012 indicate that assimilative capacity is not available for nitrate + nitrite nitrogen in the receiving water. Assimilative capacity was determined as specified below:

- (1) Review EPA's 303(d) list to determine if the water body is impaired for nitrate + nitrite nitrogen.

The water body is not listed in EPA's 303(d) list for nitrate + nitrite nitrogen.

- (2) Identify nearby control stations to determine the "decision unit" for analysis.

Control Stations OS and NS (Stations 5 and 6, respectively) are the available reference stations and have been identified as the applicable control stations for evaluating assimilative capacity and constitutes the decision unit for the analysis.

- (3) Data from all stations (including surface, middle, and bottom) are aggregated together to represent the decision unit and generate annual geomeans. To ensure adequate assimilative capacity, the highest annual geomean for the decision unit shall not exceed 90 percent of the applicable WQS.

The resulting geomeans were:

Year	Result (µg/L)
2008	3.65
2009	5.04
2010	5.27
2011	8.25
2012	8.57

The highest annual geomean for the decision unit of 8.57 µg/L is greater than 90 percent of the applicable WQS (4.5 µg/L). Assimilative capacity is not present in the receiving water.

- (4) Consider other available information if available, including studies, reports, and receiving water data trends.

Additional information is not currently known that would support assimilative capacity for nitrate + nitrite nitrogen. Therefore, assimilative capacity has not been granted for nitrate + nitrite nitrogen based on receiving water data.

Because assimilative capacity is not available in the receiving water, dilution cannot be granted for nitrate + nitrite nitrogen, and the WQS must be applied without dilution. DOH has determined that the application of the geometric mean over a calendar year, and the 10th percentile established as a single sample maximum, will be protective of water quality. Establishing a single sample maximum based on the 10th percentile effectively prohibits the discharge of pollutants greater than the 10th percentile value, and is protective of the 2 percentile WQS.

Monthly effluent monitoring for nitrate + nitrite nitrogen was performed over the previous permit term, thus effluent data for nitrate + nitrite nitrogen is available. The maximum effluent concentration reported in the DMRs from December 2007 through December 2012 was 7.83 mg/L. The maximum annual geometric mean of the effluent concentrations reported from January 2008 through December 2012 was 5.74 mg/L. Based on the effluent data available, it does not appear feasible for the Permittee to immediately comply with final end-of-pipe effluent limitations for nitrate + nitrite nitrogen. An applicable treatment technology that will consistently achieve the proposed effluent limitations have not yet been identified by the Permittee, and will likely require significant and as yet unknown

modifications or lengthy studies. Compliance with the applicable effluent limitations will take substantial and costly facility alterations for which sufficient time will be necessary to raise funding, evaluate alternative treatments and facility upgrades, develop engineering plans, construct, and optimize treatment. Consistent with HAR, Section 11-55-21, this permit establishes a compliance schedule for the Permittee to comply with final effluent limitations for nitrate + nitrite nitrogen as soon as possible, but no longer than 9.75 years. During the compliance schedule, if it is determined that compliance with the final effluent limitations can be achieved earlier than 9.75 years from the effective date of this permit, the Permittee must comply with the final effluent limitations as soon as reasonably possible.

The proposed schedule of compliance is considered by the DOH to be in accordance with HAR, Section 11-55-21(b) and 40 CFR 122.47. HAR, Section 11-55-21(b) states, "When a schedule specifies compliance longer than one year after permit issuance, the schedule of compliance shall specify interim requirements and the dates for their achievement and in no event shall more than one year elapse between interim dates. If the time necessary for completion of interim requirement (such as the construction of a treatment facility) exceeds one year and is not readily divided into stages for completion, the schedule shall specify interim dates for the submission of reports of progress towards completion of the interim requirements."

During the compliance schedule, the Permittee is required to maintain current treatment capability. Interim effluent limitations for nitrate + nitrite nitrogen have been established until the final effluent limitations become effective.

Thus, a single sample maximum interim effluent limitation for nitrate + nitrite nitrogen of 7.83 mg/L has been established in this permit. The highest annual geomean for nitrate + nitrite nitrogen is 5.74 mg/L (from 2007 through 2012), and has been established as an annual average interim effluent limitation.

Anti-backsliding regulations are satisfied because the effluent limitations were not established in the previous permit for nitrate + nitrite nitrogen, thus these limitations are at least as stringent as the previous permit.

f. pH

The previous permit required the pH of the effluent to be between 6.0 and 9.0 Standard Units based on the Technology-Based Effluent Limitations per 40 CFR 133.102. Anti-backsliding requirements are satisfied because effluent limitations for pH are equal to or more stringent than effluent

limitations contained in the previous permit. pH is also limited at the edge of the ZOM to be between 7.0 and 8.6 Standard Units, thus water quality is also being protected.

g. Enterococci

The discharge consists of treated sewage which may contain pathogens at elevated concentrations if not properly disinfected, sufficient to impact human health or the beneficial uses of the receiving water. To ensure the protection of human health, this permit establishes effluent limitations for enterococcus.

HAR, Section 11-54-8(b) establishes water quality objectives for marine recreational waters within 300 meters (1,000 feet) of shore. As discussed in Part E.3.a. of this Fact Sheet, the draft permit establishes receiving water limitations for marine recreational waters within 300 meters (1,000 feet) from shore based on State regulations contained in HAR, Chapter 11-54. Federal regulations at 40 CFR 131.41(c)(2) establish water quality standards for bacteria in marine waters beyond 300 meters from shore, based on CWA Section 304(a). 40 CFR 122.44(d)(1)(vi)(B) states that where a State has not established a water quality criterion for a specific pollutant with reasonable potential, the permitting authority must establish effluent limitations on a case-by-case basis, using EPA's water quality criteria published under Section 304(a) of the CWA. Since Outfall Serial No. 001 is beyond 300 meters (1,000 feet) off shore, there is no applicable State water quality objective for the discharge. EPA's criteria for enterococcus specified in 40 CFR 131.41 is applicable to Hawaii, except for coastal recreation waters within 300 meters of the shoreline, as stated in 40 CFR 131.41(e)(2).

The applicable single sample maximum criteria for marine waters defined as infrequent use coastal recreation waters is 501 CFU/100 mL.

Receiving water data from January 2008 through December 2012 indicate that there were no exceedances of enterococcus at the edge of the mixing zone, as seen in Table F-8. The current permit did not require enterococcus monitoring at the ZOM control stations, therefore, DOH used the results at the ZOM stations to determine assimilative capacity. There were no exceedances of the permit limits (7 CFU/100ml – geometric mean, 100 CFU/100 ml – single sample maximum) so DOH concludes that there is assimilative capacity for enterococcus within the receiving water, thus dilution should be granted for enterococcus. Monitoring at the ZOM control stations will be required in the proposed permit.

(1) **Enterococci WQS.** HAR, Chapter 11-54 does not have a standard at the discharge point of the diffuser. 40 CFR 131.41 established a WQS of a geometric mean of 35 CFU/100 mL.

(2) **RPA Results.** The highest reported monthly geometric mean of 61 samples was 41000 CFU/100 mL. A CV of 0.692 was calculated. Table 3-2 of the TSD gives a 95% multiplier of 0.99. $D_m = 1/62.8$.

$$\begin{aligned}\text{Projected Maximum RWC} &= \text{MEC} \times 95\%_{\text{ratio}} \times D_m \\ &= 41000 \times 0.99 \times 1/62.8 \\ &= 644.5 \text{ CFU/100 mL}\end{aligned}$$

$$40 \text{ CFR } 131.41 \text{ WQS} = 35 \text{ CFU/100 mL}$$

The projected maximum receiving water concentration exceeds the WQS for this pollutant, demonstrating reasonable potential. Therefore, the proposed permit establishes effluent limitations for enterococci.

(3) **Enterococci WQBELs.** WQBELs for enterococci is established as 35 CFU/100 mL multiplied by the dilution factor of 62.8, or 2198 CFU/100 mL.

(4) **Feasibility.** The effluent samples will be collected at a location that will allow for longer chlorine contact time, therefore, reducing the enterococci numbers. The discharger believes they will be able to comply with the established limit.

(5) **Anti-backsliding.** There were no effluent limitations for enterococci in the previous permit. Anti-backsliding requirements are satisfied because even though the permit limit is increased by the dilution factor, it is based on the WQS that was applied at the edge of the ZOM in the previous permit.

The draft permit establishes the following end-of-pipe effluent limitations and monitoring requirements for enterococcus based on 40 CFR 131.41(c)(2) discussed below.

(a) Due to the potential for human contact within the receiving water, a geometric mean of 2,198 CFU per 100 milliliters, based on the geometric mean of 35 CFU per 100 milliliters and a dilution of 62.8:1. Based on effluent data from December 2007 through December 2012, the maximum reported effluent enterococcus concentration geometric mean was 41,000 CFU per 100 milliliters, indicating that the Permittee has the reasonable potential to cause or contribute to an exceedance of the water quality criteria for

enterococcus. Thus, the monthly geometric mean of 2,198 CFU per 100 milliliters has been applied as an effluent limitation in the draft permit.

- (b) Considering the applicable single sample maximum for coastal recreation waters of 501 CFU per 100 milliliters and a dilution of 62.8:1, the resulting WQBEL is 31,462 CFU per 100 milliliters. Based on effluent data from December 2007 through December 2012, the maximum reported effluent enterococcus concentration geometric mean was 41,000 CFU per 100 milliliters, indicating that the Permittee has the reasonable potential to cause or contribute to an exceedance of the water quality criteria for enterococcus. Thus, the single sample maximum of 31,462 CFU per 100 milliliters has been applied as an effluent limitation in the draft permit.

h. Whole Effluent Toxicity (WET)

WET limitations protect receiving water quality from the aggregated toxic effect of a mixture of pollutants in an effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent or receiving water. The WET approach allows for protection of the narrative criterion specified in HAR, Chapter 11-54-4(b)(2) while implementing Hawaii's numeric WQS for toxicity. There are two types of WET tests – acute and chronic. An acute toxicity test is conducted over a short period of time and measures mortality. A chronic toxicity test is generally conducted over a longer period of time and may measure mortality, reproduction, or growth.

The previous permit established a chronic WET effluent limitation at Outfall Serial No. 001 for *Ceriodaphnia dubia* and additional monitoring for *Tripneustes gratilla*.

Whole effluent toxicity data for the time period between December 2007 and December 2012 using the test species *C. dubia* did not result in an exceedance of the chronic toxicity effluent limitation; however, monitoring results for *T. gratilla* indicates that the Discharger has reasonable potential to exceed the effluent limitation for chronic toxicity of 62.8 TU_c established in the previous permit for Outfall Serial No. 001, with effluent results as high as >253 TU_c.

A chronic WET effluent limitation has been established at Outfall Serial No. 001. For improved WET analysis, DOH has begun implementing EPA's Test of Significant Toxicity Method (TST) for WET effluent limitations within the State. As such, the chronic WET effluent limitation at Outfall

Serial No. 001 has been revised to be consistent with the TST method using *T. gratilla*.

T. gratilla is a native species to Hawaii, and as observed in historic effluent data, *T. gratilla* is more sensitive to potential toxic pollutants within the Permittee's effluent than *C. dubia*. The use of *T. gratilla* is representative of toxic impacts on local species.

Test procedures for measuring toxicity to marine organisms of the Pacific Ocean, including *T. gratilla*, are not provided at 40 CFR 136. Consistent with the Preamble to EPA's 2002 Final WET Rule, permit writers may include (under 40 CFR 122.41(j)(4) and 122.44(i)(iv)) requirements for the use of test procedures that are not approved at 40 CFR Part 136 on a permit-by-permit basis. The use of alternative methods for West coast facilities in Hawaii is further supported under 40 CFR 122.21(j)(5)(viii), which states, "West coast facilities in..., Hawaii,... are exempted from 40 CFR [P]art 136 chronic methods and must use alternative guidance as directed by the permitting authority."

EPA has issued applicable guidance for conducting chronic toxicity tests using *T. gratilla* in Hawaiian Collector Urchin, *Tripneustes gratilla* (Hawa'e) Fertilization Test Method (Adapted by Amy Wagner, EPA Region 9 Laboratory, Richmond, CA from a method developed by George Morrison, EPA, ORD Narragansett, RI and Diane Nacci, Science Applications International Corporation, ORD Narragansett, RI) (EPA/600/R-12/022).

As previously discussed, reasonable potential for WET has been determined for Outfall Serial No. 001 and an effluent limitation must be established in accordance with 40 CFR 122.44(d)(1). Further, a WET effluent limitation and monitoring are necessary to ensure compliance with applicable WQS in HAR, Chapter 11-54-4(b)(2).

Over the current permit term, using *T. gratilla*, the Permittee was passing the chronic toxicity trigger of 62.8 TU_c until September 2010. They have since passed six (6) consecutive WET tests. As such, reasonable potential for chronic toxicity has been determined for this discharge and an effluent limitation must be established in accordance with 40 CFR 122.44(d)(1) and HAR, Section 11-54-4(b)(2)(B).

The proposed WET limitation and monitoring requirements for a submerged discharge are incorporated into the draft permit in accordance with the EPA national policy on water quality-based permit limitations for toxic pollutants issued on March 9, 1984 (49 FR 9016); HAR, Section 11-54-4(b)(4)(A); and the *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, June 2010).

Consistent with HAR, Section 11-54-4(b)(2)(B), this Permit establishes a chronic toxicity effluent limitation based on EPA's Test of Significant Toxicity (TST) hypothesis testing approach. The TST approach was designed to statistically compare a test species response to the in-stream waste concentration (IWC) and a control.

For continuous discharges through submerged outfalls, HAR 11-54-4(b)(4)(A) requires the no observed effect concentration (NOEC), expressed as a percent of effluent concentration, to not be less than 100 divided by the minimum dilution. Thus, the minimum dilution of 62.8:1 is most appropriate for establishing a critical dilution factor. The following equation is used to calculate the IWC where dilution is granted:

$$\begin{aligned}\text{IWC} &= 100/\text{critical dilution factor} \\ &= 100/62.8 \\ &= 1.59\%\end{aligned}$$

For any one chronic toxicity test, the chronic WET permit limit that must be met is rejection of the null hypothesis (H_0):

IWC (1.59 percent effluent) mean response $\leq 0.75 \times$ Control mean response.

A test result that rejects this null hypothesis is reported as "Pass" on the DMR form. A test result that does not reject this null hypothesis is reported as "Fail" on the DMR form.

The acute and chronic biological effect levels (b values of 20% and 25% respectively) incorporated into the TST define EPA's unacceptable risks to aquatic organisms and substantially decrease the uncertainties associated with the results obtained from EPA's traditionally used statistical endpoints for WET. Furthermore, the TST reduces the need for multiple test concentrations which, in turn, reduces laboratory costs for dischargers while improving data interpretation. A significant improvement offered by the TST approach over traditional hypothesis testing is the inclusion of an acceptable false negative rate. While calculating a range of percent minimum significant differences (PMSDs) provides an indirect measure of power for the traditional hypothesis testings approach, setting appropriate levels for β or α using the TST approach establishes explicit test power and provides motivation to decrease within test variability which significantly reduces the risk of under reporting toxic events (USEPA 2010[1]).

[1] U.S. Environmental Protection Agency. 2002a. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (5th Edition). EPA 821-R-02-012. Washington, DC: Office of Water.

Taken together, these refinements simplify toxicity analyses, provide dischargers with the positive incentive to generate high quality data, and afford effective protection to aquatic life.

A WET effluent limitation based on the TST hypothesis testing approach is protective of the chronic water quality standards for toxicity contained in HAR, Section 11-54-4(b)(4)(B) and is not considered to be less stringent. Use of the TST approach is consistent with the requirements of State and Federal anti-backsliding regulations.

i. Summary of Final Effluent Limitations

HAR, Section 11-55-20 requires that daily quantitative limitations by weight be established where possible. Thus, in addition to concentration based-effluent limitations, mass-based effluent limitations (in pounds per day) have been established where applicable based on the following formula:

$$\text{lbs/day} = 8.34 * \text{concentration (mg/L)} * \text{flow (MGD)}$$

40 CFR 122.45(b)(1) requires that mass-based effluent limitations for POTWs be based on design flow. The previous permit established mass based effluent limitations on a design flow of 5.0 MGD. This draft permit continues to include mass-based effluent limitations using a flow of 5.0 MGD.

The following table lists final effluent limitations at Outfall Serial No. 001 contained in the draft permit and compares them to effluent limitations contained in the previous permit.

Table F-6. Summary of Final Effluent Limitations – BOD₅ and TSS

Parameter	Units	Effluent Limitations Contained in the Previous Permit			Proposed Effluent Limitations		
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily
Biochemical Oxygen Demand (BOD) (5-day @ 20 Deg. C)	mg/L	30	45	--	30	45	--
	kg/day ¹	568	852	--	--	--	--
	lbs/day ²	--			1251	1876	--
	% Removal	As a monthly average, not less than 85 percent removal efficiency from the influent stream.			The average monthly percent removal shall not be less than 85 percent.		
Total Suspended Solids (TSS)	mg/L	30	45	--	30	45	--
	kg/day ¹	568	852	--	--	--	--
	lbs/day ²	--			1251	1876	--
	% Removal	As a monthly average, not less than 85 percent removal efficiency from the influent stream.			The average monthly percent removal shall not be less than 85 percent.		

¹ Based on a design flow of 5.0 MGD.

² Based on a design flow of 5.0 MGD. Compliance with mass-based effluent limitations shall be determined using the following formula: lbs/day = 8.34 * concentration (mg/L) * flow (MGD).

Table F-7. Summary of Final Effluent Limitations – All Other Pollutants

Parameter	Units	Effluent Limitations Contained in the Previous Permit			Proposed Effluent Limitations		
		Average Annual	Average Monthly	Maximum Daily	Average Annual	Average Monthly	Maximum Daily
pH	s.u.	Not less than 6.0 and not greater than 9.0			Not less than 6.0 and not greater than 9.0		
Cyanide	µg/L	--	--	--	--	--	62.8
	lbs/day ¹	--	--	--	--	--	2.6
Enterococci	CFU/100 mL	--	--	--	--	2,198 ²	31,462 ³
Nitrate Plus Nitrite Nitrogen	µg/L	--	--	--	--	--	4
	lbs/day ¹	--	--	--	--	--	4
Chronic Toxicity – <i>Ceriodaphnia Dubia</i>	TUc	--	--	62.8	--	--	--
Chronic Toxicity – <i>Tripneustes Gratilla</i>	TUc	--	--	--	--	--	Pass ⁵

¹ Based on a design flow of 5.0 MGD. Compliance with mass-based effluent limitations shall be determined using the following formula: lbs/day = 8.34 * concentration (mg/L) * flow (MGD).

² Effluent limitation expressed as a monthly geometric mean.

³ Effluent limitation expressed as a single sample maximum.

⁴ **Final Effluent Limitations (effective <DATE – 9.75 years after effective date>):** Discharge from the facility shall not exceed an annual geometric mean of 5.00 µg/L (0.208 lbs/day) nor a single sample maximum of 14.00 µg/L (0.583 lbs/day).

Interim Effluent Limitations (effective through <DATE – 9.75 years after effective date>):

Discharge from the facility shall not exceed an annual geometric mean of 5,736 µg/L (239 lbs/day) nor a single sample maximum of 7,830 µg/L (326 lbs/day).

⁵ "Pass", as described in section D.2.h of this Fact Sheet.

j. Satisfaction of Anti-Backsliding Requirements

The CWA specifies that a revised permit may not include effluent limitations that are less stringent than the previous permit unless a less stringent limitation is justified based on exceptions to the anti-backsliding provisions contained in CWA Sections 402(o) or 303(d)(4), or, where applicable, 40 CFR 122.44(l). These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed, including if new information is available which was not available at the time of permit issuance and which would have justified the application of a less stringent effluent limitation at the time of permit issuance.

The effluent limitations and other requirements established by the proposed permit are at least as stringent as the effluent limitations in the previous permit and are consistent with state and federal anti-backsliding regulations.

k. Satisfaction of Antidegradation Policy Requirements

The DOH established the State antidegradation policy in HAR, Section 11-54-1.1, which incorporates the federal antidegradation requirements at 40 CFR 131.12. HAR, Section 11-54-1.1 requires that the existing quality of waters be maintained unless degradation is justified based on specific findings demonstrating that allowing lower water quality is necessary to accommodate economic or social development in the area in which the waters are located.

The draft permit does not allow for an increase in flow or mass of pollutants to the receiving water. The permitted discharge is consistent with antidegradation provisions of 40 CFR 131.12 and HAR, Section 11-54-1.1. The impact on existing water quality will be insignificant and the level of water quality necessary to protect the existing uses will be maintained and protected.

E. Rationale for Receiving Water and Zone of Mixing (ZOM) Requirements

1. Summary of ZOM Water Quality Standards and Monitoring Data

The following are a summary of the geometric mean values reported for each offshore monitoring location by the Hilo Wastewater Treatment Plant in the monthly and quarterly DMRs from January 2008 through December 2012 (less missing data from April 2010 and June 2012).

Table F-8. Offshore Monitoring Stations

Station	Highest Observed Geometric Mean ¹						
	Enterococcus ²	Nitrate + Nitrite Nitrogen ²	Ammonia Nitrogen ²	Total Nitrogen ²	Total Phosphorus ²	Turbidity ²	Chlorophyll <i>a</i> ²
	CFU/100 mL	µg/L	µg/L	µg/L	µg/L	NTU	µg/L
ZOM-1	2.5	1.84	1.08	119.52	14.81	0.16	0.15
ZOM-2	1.7	3.41	1.71	115.21	15.19	0.14	0.12
ZOM-3	2.6	9.27	1.44	119.48	15.49	0.16	0.13
ZOM-4	1.3	5.11	1.64	116.96	14.64	0.16	0.16
O/S (Control Station)	--	3.90	1.86	115.68	15.19	0.14	0.14
N/S (Control Station)	--	20.51	2.51	129.16	18.35	0.18	0.16
Applicable Water Quality Standard	³	5.00	3.50	150.00	20.00	0.50	0.30

¹ Source: Monthly DMRs submitted by the Hilo Wastewater Treatment Plant from January 2008 through December 2012.

² Reported geometric mean is the maximum annual geometric mean from the top, middle, and bottom sampling points at each station.

³ The water quality standard during the drafting of the previous permit was a geometric mean of 7 CFU/100 mL. The water quality standard established in HAR 11-54 during the drafting of the draft permit is a geometric mean of 35 CFU/100 mL.

The following tables show individual values for stations pertaining to the ZOM collected monthly from December 2007 through December 2012. None of the following results were in non-compliance with the water quality standards.

Table F-9a. Range of pH Data

pH	Water Quality Standard	7.0 to 8.6 Standard Units
	STATION	
All Depths	Compliance Stations	Control Stations
Range	8.003 - 8.45	8.003 - 8.27

Table F-9b. Range of Temperature Data

Temperature	Water Quality Standard	Shall not vary more than 1°C from ambient conditions
	STATION	
All Depths	Compliance Stations	Control Stations
Range	19.47 – 26.77	21.34 – 26.49

Table F-9c. Range of Dissolved Oxygen Data

Dissolved Oxygen	Water Quality Standard	Not less than 75% Saturation
	STATION	
All Depths	Compliance Stations	Control Stations
Range	76.26 – 115.99	78.83 – 117.01

Table F-9d. Range of Salinity Data

Salinity	Water Quality Standard	Shall not vary more than 10% from natural or seasonal changes considering hydrologic input and oceanographic factors
	STATION	
All Depths	Compliance Stations	Control Stations
Range	26.329 – 35.238	22.924 – 35.247

2. Existing Receiving Water Limitations and Monitoring Data

a. Shoreline Stations

The following are a summary of the geometric mean values reported for each shoreline monitoring location by the Hilo Wastewater Treatment Plant in the monthly DMRs from January 2008 through December 2012 (less missing data from July 2011 and June 2012).

Table F-10. Shoreline Monitoring Stations

Station	Geometric Mean ¹
	Enterococcus ²
	CFU/100 mL
S-1	57.6
S-2	57.4

Station	Geometric Mean ¹
	Enterococcus ²
	CFU/100 mL
S-3	17.7
S-4	6.9
S-5	8.5
S-6	6.3
S-7	8.7
Applicable Water Quality Standard	3

¹ Source: Monthly DMRs submitted by the Hilo Wastewater Treatment Plant from January 2008 through December 2012.

² Reported geometric mean is the maximum annual geometric mean reported at each monitoring station.

³ The water quality standard during the drafting of the previous permit was a geometric mean of 7 CFU/100 mL. The water quality standard established in HAR 11-54 during the drafting of the draft permit is a geometric mean of 35 CFU/100 mL.

b. Nearshore Stations

The following are a summary of the geometric mean values reported for each nearshore monitoring location by the Hilo Wastewater Treatment Plant in the monthly DMRs from January 2008 through December 2012 (less missing data from July 2011 and June 2012).

Table F-11. Nearshore Monitoring Stations

Station	Geometric Mean ¹
	Enterococcus ²
	CFU/100 mL
N-1	4.31
N-2	2.65
N-3	2.74
N-4	3.92
Applicable Water Quality Standard	3

¹ Source: Monthly and Quarterly DMRs submitted by the Hilo Wastewater Treatment Plant from January 2008 through December 2012.

² Reported geometric mean is the maximum annual geometric mean from the top, middle, and bottom sampling points at each station.

³ The water quality standard during the drafting of the previous permit was a geometric mean of 7 CFU/100 mL. The water quality standard established in HAR 11-54 during the drafting of the draft permit is a geometric mean of 35 CFU/100 mL.

3. Proposed Receiving Water Limitations

a. Basic Water Quality Criteria Applicable to All Waters

- (1)** The discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the DOH, as required by the Water Quality Act of 1987 (P.L. 100-4) and regulations adopted thereunder. The proposed permit incorporates receiving water limitations and requirements to ensure the facility does not exceed applicable WQS.
- (2)** The Pacific Ocean, in that area, is classified by the DOH as Class A Wet Open Coastal Waters under HAR, Section 11-54-6(b)(2)(B). It is the objective of Class A waters that their use for recreational purposes and aesthetic enjoyment be protected. Any other use shall be permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. These waters shall not act as receiving waters for any discharges which have not received the best degree of treatment or control compatible with the criteria established for this class. The proposed permit incorporates receiving water limitations for the protection of the beneficial uses of the Pacific Ocean.

The Permittee is required to comply with the HAR, Chapter 11-54, Basic Water Quality Criteria which has been incorporated as part of the proposed permit under Section 1 of the DOH Standard NPDES Permit Conditions.

- (3)** The following criteria are included in HAR, Section 11-54-8(b) for recreational areas in marine recreational waters:
 - (a)** Within 300 meters of the shoreline, including natural public bathing or wading areas, enterococcus content shall not exceed a geometric mean of 35 CFU per 100 milliliters in not less than five (5) samples which shall be spaced to cover a period between 25 and 30 days. No single sample shall exceed the single sample maximum of 104 CFU per 100 milliliters.

Based on the *Water Quality Standards for Coastal and Great Lakes Recreation Waters, Final Rule* (69 FR 67221), the previous permit included a geometric mean of 35 CFU per 100 milliliters and a single sample maximum of 104 CFU per 100 milliliters. In addition, based on the State Enterococcus standard at the time of reissuance, the previous permit included a geometric mean of 7 CFU per 100 milliliters and a single sample maximum of 100 CFU

per 100 milliliters. However, as explained by the DOH in *Rationale for Proposed Revisions to Hawaii Administrative Rules Title 11 Department of Health Chapter 54 Water Quality Standards*, the State enterococcus standard of 7 CFU per 100 milliliters was based mainly on a health risk assessment, not as a regulatory limit. In the rationale, the DOH recommended that the State enterococcus water quality standard be revised to a geometric mean of 35 CFU per 100 milliliters and a single sample maximum value of 104 CFU per 100 ml to be consistent with federal standards. The new standards were adopted by the DOH on June 15, 2009, and approved by the EPA on March 19, 2010. Therefore, the draft permit only includes the new enterococcus standards from HAR, Section 11-54-8(b) for recreational waters within 300 meters of shoreline. Since the new water quality standards were adopted by the DOH and EPA for all marine recreational waters, DOH has determined that the impact the new water quality standards established in the draft permit will be insignificant and the level of water quality necessary to protect the existing uses will be maintained and protected.

- (b) At locations where sampling is less frequent than five (5) samples per 25 to 30 days, no single sample shall exceed the single sample maximum nor shall the geometric mean of these samples taken during the 30-day period exceed 35 CFU per 100 milliliters.
- (c) Raw or inadequately treated sewage, sewage for which the degree of treatment is unknown, or other pollutants of public health significance, as determined by the director of health, shall not be present in natural public swimming, bathing, or wading areas. Warning signs shall be posted at locations where human sewage has been identified as temporarily contributing to the enterococcus count.

The draft permit establishes these criteria for recreational areas, as described in Part C of the draft permit, to be consistent with HAR, Section 11-54-8(b).

b. Specific Criteria for “Class A Wet Open Coastal Waters”

Table F-12. Specific Criteria for “Class A Wet Open Coastal Waters”

Parameter	Units	Geometric mean not to exceed the given value	Not to exceed the given value more than 10% of the time	Not to exceed the given value more than 2% of the time
Total Nitrogen	µg/L	150.00	250.00	350.00

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Parameter	Units	Geometric mean not to exceed the given value	Not to exceed the given value more than 10% of the time	Not to exceed the given value more than 2% of the time
Ammonia Nitrogen	µg/L	3.50	8.50	15.00
Nitrate + Nitrite Nitrogen	µg/L	5.00	14.00	25.00
Total Phosphorus	µg/L	20.00	40.00	60.00
Light Extinction Coefficient	k units	0.20	0.50	0.85
Chlorophyll <i>a</i>	µg/L	0.30	0.90	1.75
Turbidity	NTU	0.50	1.25	2.00
pH	standard units	Shall not deviate more than 0.5 standard units from a value of 8.1, except at coastal locations where and when freshwater from stream, stormdrain, or groundwater discharge may depress the pH to a minimum level of 7.0.		
Dissolved Oxygen	% saturation	Shall not be less than 75 percent saturation, determined as a function of ambient water temperature and salinity.		
Temperature	°C	Shall not vary more than 1°C from ambient conditions.		
Salinity	ppt	Shall not vary more than 10 percent from natural or seasonal changes considering hydrologic input and oceanographic factors.		

The specific water quality criteria listed at HAR, Section 11-54-6(b)(3) for “Class A Wet Open Coastal Waters” shall apply to the treated wastewater through Outfall Serial No. 001, as seen in the table above, at the edge of the mixing zone.

These requirements are consistent with HAR, Chapter 11-54 and retained from the previous permit.

c. Zone of Mixing (ZOM)

HAR, Chapter 11-54 allows for a ZOM, which is a limited area around outfalls to allow for initial dilution of waste discharges, if the ZOM is in compliance with requirements in HAR, Section 11-54-9(c). The Permittee has requested that the existing ZOM, also issued to the Hilo Wastewater Treatment Plant, for the assimilation of treated wastewater be retained. Consistent with the current permit, the ZOM requested is a circular area with a radius of 1,000 feet and centered at Latitude 19°44'39"N, Longitude 155°02'58"W, and extends vertically downward to the ocean floor.

- (1) Prior to the renewal of a ZOM, the environmental impacts, protected uses of the receiving water, existing natural conditions, character of the effluent, and adequacy of the design of the outfall must be considered. The following findings were considered:

 - (a) The Permittee's ZOM application indicates that the existing physical environment is a marine bottom, class II reef flats. The ZOM application indicates that no major physical effects are expected due to the continuation of the ZOM.
 - (b) Effluent data and receiving water data are provided in Tables F-5, F-8, F-9, F-10, and F-11 of this Fact Sheet. The effluent and receiving water data indicate there is a potential for nutrient (nitrate + nitrite nitrogen) impairment as discussed in Part D.2.e. of this Fact Sheet. However, biological monitoring of the Facility's diffuser found that no evidence of negative impacts to fish populations due to the diffuser was identified.
- (2) HAR, Subparagraph 11-54-9(c)(5) prohibits the establishment of a ZOM unless the application and supporting information clearly show: that the continuation of the ZOM is in the public interest; the discharge does not substantially endanger human health or safety; compliance with the WQS would produce serious hardships without equal or greater benefits to the public; and the discharge does not violate the basic standards applicable to all waters, will not unreasonably interfere with actual or probable use of water areas for which it is classified, and has received the best degree of treatment or control. The following findings were made in consideration of HAR, Subparagraph 11-54-9(c)(5):

 - (a) The Facility treats domestic wastewater for approximately 31,000 people in the immediate Hilo area and is a necessity for public health. There are no other treatment facilities currently servicing this area and a cessation of function or operation would cause severe hardship to the residents.
 - (b) The level of treatment of the discharge and the depth and distance of the outfall offshore does not substantially endanger human health or safety. A review of the shoreline, nearshore, and offshore enterococcus bacteria data does not indicate a shoreward movement of the ocean outfall discharge.
 - (c) The feasibility and costs to install treatment necessary to meet applicable WQS end-of-pipe, or additional supporting information, were not provided by the Permittee to demonstrate potential

hardships. As discussed in Part E.3.c.(2)(a), the operation of the Facility has been found to benefit the public. No information is known that would revise the finding during the previous permit term that compliance with the applicable WQS without a ZOM would produce serious hardships without equal or greater benefits to the public.

- (d) As discussed in Part D.2.c.(5)(c) of this Fact Sheet, effluent data indicates the presence of pollutants in excess of applicable WQS. However, this permit establishes water quality-based effluent limitations based on WQS. The Permit requires compliance with the effluent limitations and conditions which are protective of the actual and probable uses of the receiving water and implement applicable technology-based effluent limitations.

The Department has determined that the ZOM satisfies the requirements in HAR, Section 11-54-09(c)(5).

The establishment of the ZOM is subject to the conditions specified in Part D. of the draft permit.

F. Rationale Monitoring and Reporting Requirements

40 CFR 122.41(j) specify monitoring requirements applicable to all NPDES permits. HAR, Section 11-55-28 establishes monitoring requirements applicable to NPDES permits within the State of Hawaii. 40 CFR 122.48 and HAR, Section 11-55-28 require that all NPDES permits specify requirements for recording and reporting monitoring results. The principal purposes of a monitoring program are to:

- Document compliance with waste discharge requirements and prohibitions established by the DOH;
- Facilitate self-policing by the Permittee in the prevention and abatement of pollution arising from waste discharge;
- Develop or assist in the development of limitations, discharge prohibitions, national standards of performance, pretreatment and toxicity standards, and other standards; and
- Prepare water and wastewater quality inventories.

The draft permit establishes monitoring and reporting requirements to implement federal and State requirements. The following provides the rationale for the monitoring and reporting requirements contained in the draft permit.

1. Influent Monitoring

Influent monitoring is required to assess the performance of treatment facilities and to evaluate compliance with effluent limitations. All influent monitoring requirements have been retained from the previous permit. Additionally, influent monitoring for nitrate plus nitrite nitrogen and cyanide has been established in the draft permit in order to determine if said pollutants are present in the influent in elevated concentrations. The proposed influent water monitoring requirements are specified in Part A.1. of the draft permit.

2. Effluent Monitoring

The following monitoring requirements are applicable at Outfall Serial No. 001.

- a.** Monitoring requirements for BOD₅, TSS, and pH are retained from the previous permit to determine compliance with the technology-based effluent limitations.
- b.** Monitoring requirements for enterococcus and nitrate + nitrite nitrogen have been retained from the previous permit to determine compliance with effluent limits and water quality standards and to collect data for future RPAs.
- c.** Monitoring requirements for total nitrogen, ammonia nitrogen, total phosphorus, and turbidity have been retained from the previous permit to collect data for future RPAs.
- d.** Monitoring requirements for turbidity have been retained from the previous permit to compare to the ZOM monitoring results.
- e.** Monitoring requirements for flow have been retained from the previous permit to calculate pollutant loading and to determine compliance with mass-based effluent limitations.
- f.** Monitoring requirements for cyanide have been added to the draft permit to determine compliance with newly established effluent limitations for cyanide.
- g.** Monitoring requirements for the priority pollutants listed in Attachment B are retained from the previous permit in order to collect data for future RPAs.

3. Whole Effluent Toxicity Monitoring

Consistent with the previous permit, monthly whole effluent toxicity testing is required in order to determine compliance with whole-effluent toxicity effluent limitations as specified in Parts A.1. and B. of the draft permit.

4. Receiving Water Quality Monitoring Requirements

a. Ocean Outfall Monitoring

At least once during the term of this permit, the Permittee shall inspect the ocean outfall and submit the investigation findings to the Director. The outfall inspection shall include, but not be limited to, an investigation of the structural integrity, operational status, and maintenance needs. The Permittee shall include findings of the inspection to the Director in the annual wastewater pollution prevention report in Part G. of the draft permit for the year the outfall inspection is conducted. This requirement is retained from the previous permit.

b. Specific Water Quality Parameters Effluent Requirements

The previous permit included operation performance thresholds for total nitrogen, ammonia nitrogen, nitrate + nitrite nitrogen, and total phosphorus and a requirement for an initial investigation evaluation plan if the threshold values are exceeded in the effluent. ZOM data from the term of the previous permit indicates total nitrogen, ammonia nitrogen, and total phosphorus do not have reasonable potential to cause or contribute to an exceedance above water quality standards for said pollutants. Thus, the draft permit does not retain operational performance thresholds for said pollutants. However, monitoring requirements for total nitrogen, ammonia nitrogen, and total phosphorus have been retained.

G. Rationale for Provisions

1. Standard Provisions

The Permittee is required to comply with DOH Standard NPDES Permit Conditions, which are included as part of the proposed permit.

2. Monitoring and Reporting Requirements

The Permittee shall comply with all monitoring and reporting requirements included in the proposed permit and in the DOH Standard NPDES Permit Conditions.

3. Special Provisions

a. Reopener Provisions

The proposed permit may be modified in accordance with the requirements set forth at 40 CFR 122 and 124, to include appropriate conditions or limitations based on newly available information, or to implement any new state water quality criteria that are approved by the EPA.

b. Special Studies and Additional Monitoring Requirements

Toxicity Reduction Requirement. The proposed permit requires the Permittee to submit an initial investigation Toxicity Reduction Evaluation (TRE) workplan to the Director which shall describe steps which the Permittee intends to follow in the event that toxicity is detected. This requirement is retained from the previous permit and is discussed in detail in Part B.5. of the proposed permit.

4. Special Provisions for Municipal Facilities

Biosolids Requirements

The use and disposal of biosolids is regulated under federal laws and regulations, including permitting requirements and technical standards included in 40 CFR 503, 257, and 258. The biosolids requirements in the proposed permit are in accordance with 40 CFR 257, 258, and 503, are based on the previous permit and are consistent with NPDES permits issued to other Hawaii POTWs.

5. Other Special Provisions

a. Wastewater Pollution Prevention Program

The draft permit requires the Permittee to submit a wastewater pollution prevention program by April 30th each year. This provision is retained from the previous permit and is required to allow DOH to ensure that the Permittee is operating correctly and attaining maximum treatment of pollutants discharged by considering all aspects of the wastewater treatment system. This provision is included in Part G. of the draft permit.

- b.** Wastewater treatment facilities subject to the draft permit shall be supervised and operated by persons possessing certificates of appropriate grade, as determined by the DOH. If such personnel are not available to staff the wastewater treatment facilities, a program to promote such certification shall be developed and enacted by the Permittee. This

provision is included in the draft permit to ensure that the facility is being operated correctly by personnel trained in proper operation and maintenance. This provision is retained from the previous permit and included in Part I.1. of the draft permit.

- c. The Permittee shall maintain in good working order a sufficient alternate power source for operating the wastewater treatment and disposal facilities. This provision is retained from the previous permit in order to ensure that if a power failure occurs, the facility is well equipped to maintain treatment operations until power resumes. If an alternate power source is not in existence, the draft permit requires the Permittee to halt, reduce, or otherwise control all discharges upon the reduction, loss, or failure of the primary source of power. This provision is included in Part I.2. of the proposed permit.

H. Public Participation

Prior to final issuance of the NPDES Permit and Zone of Mixing, a public notice of proposed permit will be published in the ***Hawaii Tribune-Herald***, soliciting public comment on the proposed action for a 30-day period. The permit application, applicable documents, proposed permit and rationale will be available for public review at the CWB office, and the Hilo and Kona District Health Offices.

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